

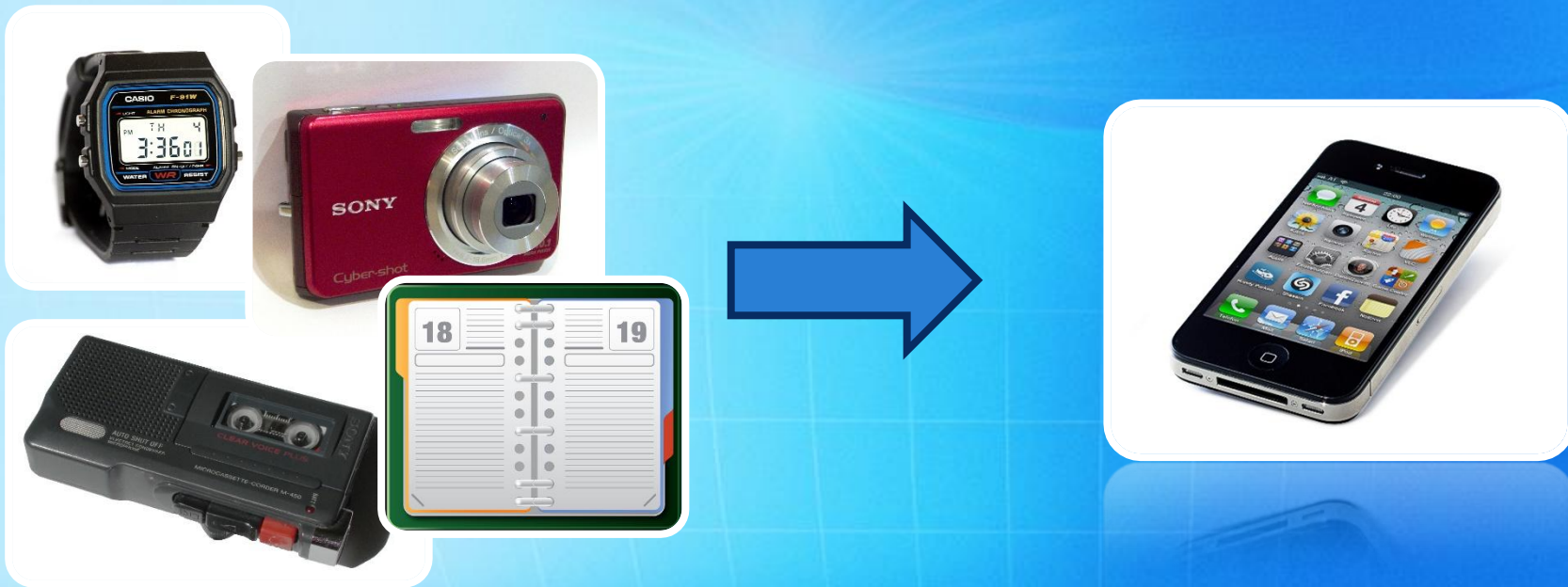
Convergence

Prof.mr.dr. E.F. ten Heuvelhof

Professor, Faculty of TPM, TU Delft

Convergence

“The tendency for different technological systems to evolve toward performing similar tasks.”



Convergence in infrastructures

- Information and communications technology
- Merger of:
 - Public Switched Telephone Network, cable network, and many other services / networks



Convergence in infrastructures

Early perception:

- Convergence will lead to a concentration of power

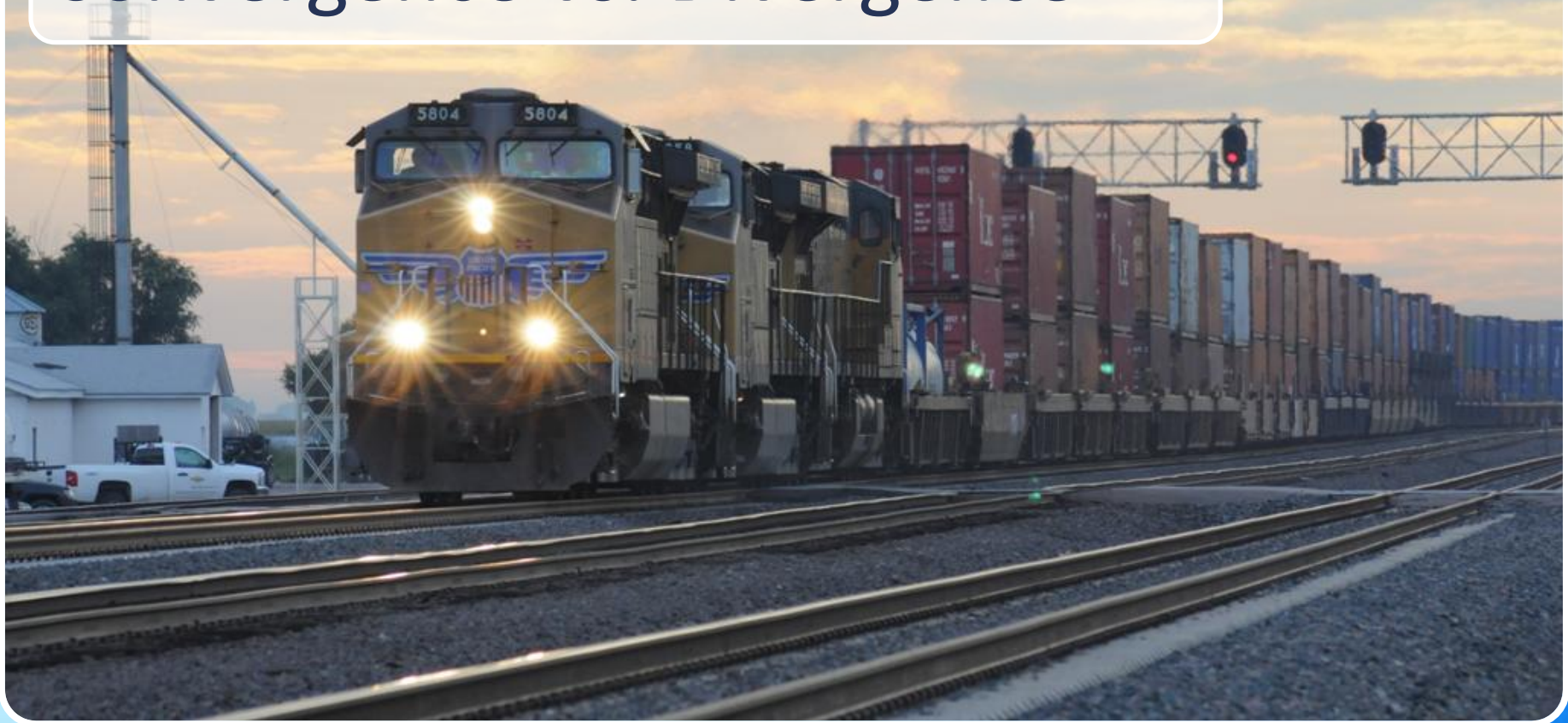
Reality:

- Convergence has boosted completion and innovation.

Convergence vs. Divergence



Convergence vs. Divergence



Convergence vs. Divergence



Issues in convergence/divergence [1/5]

1. Convergence/divergence affect users of services provided through infra-systems



Issues in convergence/divergence [2/5]

2. Convergence/divergence can lead to the inception of new business models:

- First-mover advantage
- Transformations are inhibited by large existing infrastructure companies
 - Often called **incumbent** companies

Issues in convergence/divergence [3/5]

3. Convergence/divergence is connected to processes of liberalization and market evolution.
 - E.g. decay of the telegraph system, growth of mobile telephone networks

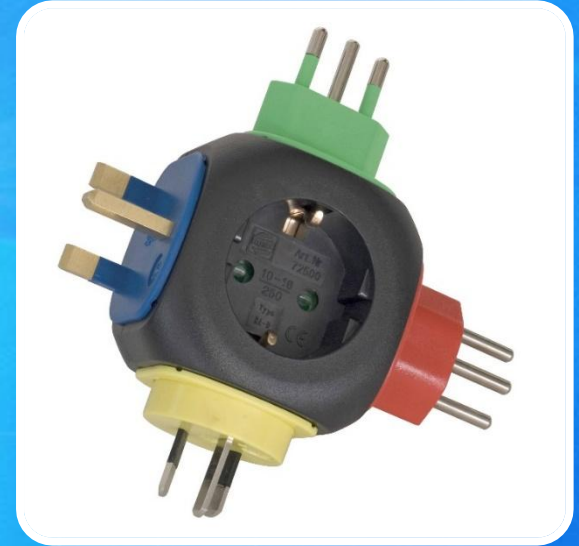
Government intervention desired because of public interests

Issues in convergence/divergence [4/5]

4. Convergence/divergence is stimulated or delayed by rules and institutions

Standardization:

- Interoperability
- Interconnectivity



Issues in convergence/divergence [4/5]

4. Convergence/divergence is stimulated or delayed by rules and institutions

Standardization:

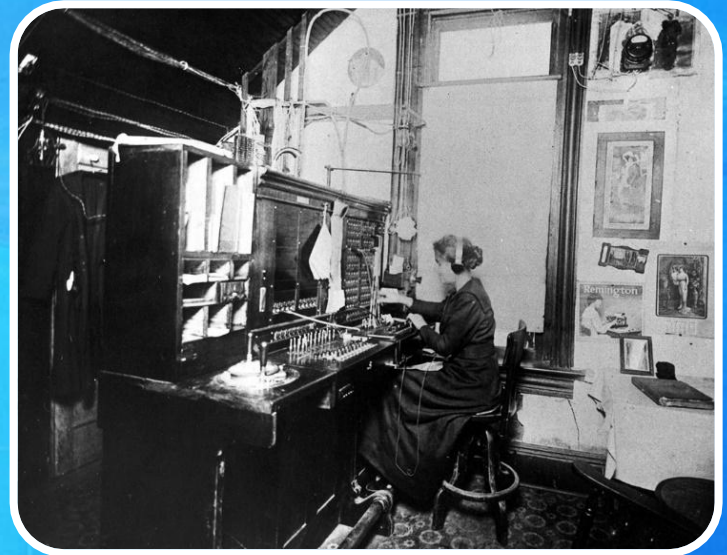
- Interoperability
- Interconnectivity



Issues in convergence/divergence [5/5]

5. Convergence/divergence cause changes in regulation

What role should the regulator have?



Issues in convergence/divergence [5/5]

5. Convergence/divergence
cause changes in regulation

*What role should the regulator
have?*



Issues in convergence/divergence [5/5]

5. Convergence/divergence cause changes in regulation

Blurring or blending of regimes

- Which rules comply?
- Which regulator will be in charge?

Drawing conclusions

Can we identify one universal trend in convergence across infra-systems?

Converging trend (e.g.):

- Digitalization of infra-systems

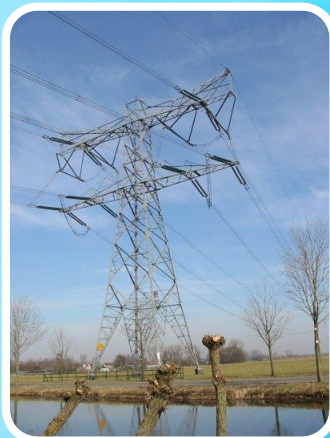
Diverging trends (e.g.):

- Green gas networks
- New communal heating systems
- Separate rain water drainage infrastructure

Drawing conclusions

Example of failed convergence:

- Internet via the power cable



Drawing conclusions

Can we identify one universal trend in convergence across infra-systems?

Convergence/divergence lead to evolution of infra-systems

- E.g. Prosumer networks,
- Fibre optic cable networks,
- Electric superhighways

Thank you for your attention!

Please post any questions you may have on our discussion forum.

Reference

http://upload.wikimedia.org/wikipedia/commons/3/36/Sony_Voice_Recorder.jpg

http://upload.wikimedia.org/wikipedia/commons/9/9a/Casio_F-91W.jpg

http://upload.wikimedia.org/wikipedia/commons/7/75/Sony_DSC-W180.JPG

http://pixabay.com/static/uploads/photo/2013/07/12/12/45/organizer-146189_640.png

http://upload.wikimedia.org/wikipedia/commons/a/aa/Iphone_4G.jpg

http://upload.wikimedia.org/wikipedia/commons/1/15/Amsterdam_ICE_3M_001.JPG

http://upload.wikimedia.org/wikipedia/commons/a/aa/Hoogspanningsmast_bij_papekop_februrari_2003.jpg

<http://upload.wikimedia.org/wikipedia/commons/7/75/Internet1.jpg>

http://upload.wikimedia.org/wikipedia/commons/6/6c/Charging_stations_in_SF_City_Hall_02_2009_02.jpg

http://upload.wikimedia.org/wikipedia/commons/2/27/Telstra_Mobile_Phone_Tower.jpg

http://upload.wikimedia.org/wikipedia/commons/6/6c/Charging_stations_in_SF_City_Hall_02_2009_02.jpg

http://upload.wikimedia.org/wikipedia/commons/7/73/72500_Reise-Stecker_komplett_D_RGB.jpg

http://farm2.staticflickr.com/1019/1396687493_9599a70819_o.jpg

http://upload.wikimedia.org/wikipedia/commons/c/c4/Freight_Train_in_Hershey,_Nebraska.JPG